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The model which accompanies this letter is made of glass, in order to show the internal arrangement.

I am, Sir,

A. Aikin, Esq.

Secretary, &c. &c.

&c. &c. &c.

HENRY WILKINSON.

No. III.

STOP-COCK FOR TRANSFERRING CORROSIVE GASES.

The SILVER VULCAN MEDAL was this Session presented to Mr. T. GRIFFITHS, Church-street, Kensington, for an improved STOP-COCK FOR CHEMICAL PURPOSES, &c. A model of his invention has been placed in the Society's repository.

THE common brass stop-cocks, if they have been employed for confining acid or other gases, especially when under pressure, are soon corroded throughout their whole interior extent, so that the plug or key becomes immovable, and the bore filled up with a salt of copper, the consequent result of chemical action upon the metal of the instrument. A stop-cock made entirely of glass has also many disadvantages: its size and clumsiness of form, together with the difficulty of uniting it securely to other apparatus, are inconveniences often felt by the experimentalist.

To obviate them, and to offer a method in which stop-cocks of the common form are united with security against

the attacks of active chemical agents, is the object of the present communication.

In accurate experiments on the absorption of gases by solid or other bodies, the advantage of having an apparatus not liable to be acted upon by the substances under examination will be readily acknowledged.

Platina is the material best adapted for this purpose, if its high price did not in most cases prohibit its use; most, or, perhaps, all its advantages may however be obtained in the method about to be described, and at a comparatively moderate expense.

The invention consists in making a stop-cock of the usual form, but of rather smaller dimensions, and selecting a piece of platina wire of sufficient thickness to allow a hole being drilled through its axis; this operation forms a thin tube of platina, which is afterwards accurately fitted into the bore of the brass stop-cock, leaving about one-sixteenth of an inch projecting at each end, which is to be opened and extended so as to cover each extremity with a plate of platina. The brass plug or key has a platina tube secured as above described, with the addition of two small discs of platina, placed at right angles to the gas-way or bore; these, together with the platina tube and brass parts of the instrument, are ground down perfectly air tight.

It will be obvious from this explanation, and upon reference to the engraving, that whether the stop-cock be open or closed, platina is opposed to the action of the gas or other agent. In the one case it protects the gas-way and ends of the instrument, in the other the small disc of platina prevents corrosion of the plug.

If it were desired to confer security to a moderate extent upon a stop-cock as usually employed, this may be

easily effected by taking a glass tube, cutting it to the required length, cementing one portion into the plug, and the other into each end of the bore; if this be carefully done, so as to avoid any fragments of glass falling into the ground parts, it will be found very effectual in preventing corrosion, the gas-way always remaining clear.

While collecting gases in a mercurial gasometer a large body of gas has to pass through the aperture of a stop-cock, which at the same time it rapidly corrodes. If a stop-cock lined with glass be employed in this experiment it will be found to possess many advantages over that in common use, with little additional trouble or expense.

To prove how accurately a glass tube may be fitted into the brass with cement, several instruments constructed in the above manner have had the tubes filled up with nitric acid without any solution of metal taking place.

It should however be remarked that the protection of the instrument is withdrawn when closed, but this is of no great consequence in common experiments. If it is an object to have it protected, in an equal degree, when open or shut, the disc of platina formerly described may be resorted to.

Reference to the engraving of Mr. T. Griffiths's improved stop-cock for chemical purposes.

Plate III., fig. 4, is a longitudinal section of a stop-cock, represented as open.

The cock A A, is made in the usual manner, but with an additional platina tube a a, passing through it, and over

its ends *b b*; the plug *B* has also a similar piece of platina tube *c*, passed through and fixed within it: there is also a disc of platina *d*, fig. 5, fixed on two opposite sides of the plug *B*, at right angles to the tube *c*, which resists the action of the gas (when shut), that may be contained in any vessel to which it is attached.

Fig. 5 is an external view of the plug *B* (in the same position as in fig. 4), showing one of the discs *d*, of platina.

Fig. 6 is a view of the opposite side of the plug, showing the end of the platina tube *c*.

No. IV.

PLAN FOR CONSUMING THE SMOKE OF STEAM-BOILERS, &c.

The LARGE SILVER MEDAL of the Society was this session presented to Mr. G. CHAPMAN of Whitby, for his METHOD OF CONSUMING THE SMOKE OF STEAM-BOILER FURNACES, &c. The following communication on the subject has been received from the candidate.

SIR,

Whitby, February 4, 1824.

I BEG leave to offer myself as a candidate for the premium offered by the Society for the encouragement of Arts, Manufactures, and Commerce, entitled "a more effectual consumption of smoke in steam engines, breweries, &c."

It is well known to all that are conversant on the subject, that it is necessary to admit a proportion of pure atmospheric air, to unite with the smoke after it is generated in